Customer No.: 31561
Docket No.: 13366-US-PA
Application No.: 10/709,924

AMENDMENTS

To the Claims:

Claim 1 (currently amended) A high-voltage metal-oxide-semiconductor (HV-MOS) device, comprising:

a substrate;

a gate dielectric layer on the substrate;

a gate on the gate dielectric layer;

a channel region in the substrate under the gate dielectric layer;

two doped regions as a source and a drain in the substrate beside the gate;

a field isolation layer between the gate and the two doped regions;

a drift region in the substrate under the field isolation layer located in one side of the at least one doped region, connecting with the channel region and the at least one doped region; and

a modifying doped region in the substrate ~~at periphery~~ located in the other side of the at least one doped region opposite to the drift region, wherein the drift region and the modifying doped region together completely surround the doped regions and are doped with the same type dopant.

Claim 2 (currently amended) The HV-MOS device of claim 1, wherein the modifying doped region is in the substrate ~~at peripheries~~ located in the other sides of the two doped regions opposite to the drift region.

Claim 3 (cancelled)

Claim 4 (original) The HV-MOS device of claim 1, wherein the field isolation layer comprises a field oxide (FOX) layer.

Claim 5 (currently amended) A high-voltage metal-oxide-semiconductor (HV-MOS) device, comprising:

a substrate;

a gate dielectric layer on the substrate;

a gate on the gate dielectric layer;

a channel region in the substrate under the gate dielectric layer;

two heavily doped regions as a source and a drain in the substrate beside the gate;

two lightly doped grade region under and surrounding the two heavily doped regions respectively;

a field isolation layer between the gate and the two heavily doped regions;

a drift region in the substrate under the field isolation layer located in one side of the at least one lightly doped grade region~~, connecting with the channel region and the at least one doped region~~; and

a modifying doped region in the substrate ~~at periphery~~ located in the other side of the at least one lightly doped grade region opposite to the drift region~~, wherein each doped region~~

~~comprises a heavily doped contact region and a lightly doped grade region under the contact region~~.

Claim 6-14 **(cancelled)**

Claim 15 (currently amended) The HV-MOS device of claim 5, wherein the modifying doped region is in the substrate ~~at the peripheries~~ located in the other sides of the two lightly doped grade regions opposite to the drift region.

Claim 16 (previously presented) The HV-MOS device of claim 5, wherein the field isolation layer comprises a field oxide (FOX) layer.

Claim 17 (currently amended) The HV-MOS device of claim 5~~6~~, wherein a doping concentration of the drift region and the modifying doped region ranges from $5\times10^{15}/cm^3$ to $5\times10^{17}/cm^3$~~the modifying doped region is in the substrate at the peripheries of the two doped regions~~.

Claim 18 (currently amended) The HV-MOS device of claim 1~~6~~, wherein a doping concentration of the drift region and the modifying doped region ranges from $5\times10^{15}/cm^3$ to $5\times10^{17}/cm^3$~~the field isolation layer comprises a field oxide (FOX) layer~~.

Claim 19 (new) The HV-MOS device of claim 5, wherein the drift region and the modifying doped region are doped with the same type dopant.